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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,910	09/20/2005	Takeshi Nakajima	278091US0PCT	4692

22850 7590 04/02/2009

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EXAMINER	
SZEWCZYK, CYNTHIA	
ART UNIT	**PAPER NUMBER**
1791	

NOTIFICATION DATE	DELIVERY MODE
04/02/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/549,910	NAKAJIMA ET AL.	
	Examiner	Art Unit	
	CYNTHIA SZEWCZYK	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *42,44,46-48,50 and 52-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *42,44,46-48,50 and 52-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. 112 2nd paragraph rejection of claim 42 has been withdrawn in view of amendment.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 42, 44, 48, 50, and 54-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over HISHINUMA et al (JP 2001-080939 A) in view of ALUMAXBATH (Tempered Glass) and LEWIS (glass) and CHAO (US 4,596,745).

HISHINUMA et al. discloses an apparatus for the production of a glass sheet with photocatalytic titanium oxide film (JPO abstract). HISHINUMA et al. discloses that an titanium oxide can be used in the film (JPO abstract) in addition to peroxy titanic acid (trans para. 0013). Since titanium oxide is a precursor to anatase titanic oxide and anatase titanic oxide is the desired end result, it would have been obvious to one of ordinary skill in the art that anatase titanic oxide could have been applied in the film liquid. HISHINUMA et al. discloses that the glass is cooled gradually after exiting the float bath before being treated by the film (trans. para. 0014). It is known in the art that non-tempered glass has no surface compression, therefore, it would have been obvious that the surface compression of the glass substrate would be under 10 MPa. HISHINUMA discloses that the glass is intended for use as windows for buildings and

automobiles (para. 0001). It is well known in the art that glass must be tempered in order to be suitable for use as windows for buildings and automobiles.

HISHINUMA is silent to the claimed temperature of the glass before applying the film. CHAO teaches a method for a applying a non-glare coating on optical glass screens. CHAO discloses that the glass is preheated to a temperature of approximately 20 °C to 75 °C (col. 3, lines 51-55), which overlaps with range of instant claim 42. CHAO discloses that higher temperatures produce a more defined surface topology and greater diffusion effect (col. 3, lines 51-55). It would have been obvious to try the preheating temperature of CHAO in HISHINUMA because HISHINUMA discloses that the process can be used to make optical lens (para. 0002) and the coating in CHAO is also a titanium element containing liquid (abstract) and provides optimal conditions for applying a titanium film on a glass sheet.

HISHINUMA et al. is silent as to the composition of the glass. The most common type of glass is soda lime glass, which contains about 20% sodium carbonate according to LEWIS, which would contain a percentage of sodium within the range in instant claim 45. It would be obvious to use conventional soda lime glass in the process of HISHINUMA et al. Therefore, the claimed invention would have been obvious.

HISHINUMA is silent to tempering the coated glass sheets. The Alumax Bath company website discloses that fully tempered glass is used in for glass products in the building industry and motor vehicle industry (p. 2). Alumax Bath discloses that tempering is achieved by quickly air quenching hot glass (p. 1). Alumax Bath discloses that in a typical manufacturing process, glass is raised to a temperature of

approximately 1200 °F (p. 1), or approximately 648 °C, which would fall into the range of instant claim 42. Alumax Bath discloses that the glass is then air quenched with blast nozzles and notes that it is important to cool the glass on both sides to avoid uneven heat extraction (p. 1). Alumax Bath discloses that a quenched condition becomes stable when the temperature is reduced to approximately 400 °F (p. 1), or approximately 200 °C, which would fall into the range of instant claim 42. Alumax Bath discloses that a fully tempered glass must have a surface compression of 10,000 psi or higher (p. 1), or 68 MPa or higher, which would fall into the range of instant claim 42. It would have been obvious that the glass of HISHINUMA would follow the guidelines of Alumax Bath, because Alumax Bath discloses guidelines for attaining glass sheets that follows the Federal Specification DD-G-1403B. Alumax Bath discloses that in order to use glass in building applications, it must meet federal, state, and local building codes. Therefore, the claimed invention would have been obvious.

It would have been obvious that through optimization testing a person having skill in the art could have arrived at the cooling formula of instant claim 42 or heating time of instant claims 42 and 44. Alumax discloses that the glass sheet is traveling through a tempering furnace at that temperature (p. 1), which indicates that the glass undergoes the temperature for an extended time. Alumax Bath discloses that the air quenching must occur quickly (p. 1), therefore it would have been obvious that the quenching could have occurred within 0.2-5 seconds as in the formula of instant claim 42.

Regarding claim 48, HISHINUMA et al. discloses that the titanium concentration is 1-20% by weight and preferably 2-10% by weight (trans. para. 20), which would incorporate the range of instant claim 48.

Regarding claim 50, HISHINUMA et al. discloses that the thickness of the film can be 0.1-1.0 μm (trans. para. 21) which would overlap with the range in instant claim 50. HISHINUMA et al. warns against using thickness less than 0.1μm since it would be unable to demonstrate sufficient photocatalyst activity (trans. para. 21).

Regarding claims 54-56, see the discussion of CHAO in claim 42 above.

Regarding claim 57, Alumax Bath discloses that in a typical manufacturing process, glass is raised to a temperature of approximately 1200 °F (p. 1), or approximately 648 °C, which would fall into the range of instant claim 57.

Regarding claim 58, Alumax Bath discloses that a quenched condition becomes stable when the temperature is reduced to approximately 400 °F (p. 1), or approximately 200 °C, which would fall into the range of instant claim 58.

Regarding claim 59, Alumax Bath discloses that a fully tempered glass must have a surface compression of 10,000 psi or higher (p. 1), or 68 MPa or higher, which would fall into the range of instant claim 59.

4. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over HISHINUMA et al (JP 2001-080939 A) in view of ALUMAXBATH (Tempered Glass) and LEWIS (glass) and CHAO (US 4,596,745) as applied to claims 42, 44, 48, 50, and 54-59 above, and further in view of GREENSBURG et al. (US 2002/0114945 A1).

HISHINUMA et al. as modified by Alumax Bath and LEWIS and CHAO discloses an apparatus for the production of a tempered glass sheet with photocatalytic titanium oxide film (DERWENT abstract). Modified HISHINUMA et al. fails to disclose the area dimensions treated. GREENSBURG et al. discloses a method for the production of a photocatalytic on a glass substrate (abstract) using spray pyrolysis (para. 20, line 3). GREENBERG et al. discloses that the coating can be titanium oxide (para. 20, line 6). GREENBERG et al. discloses an example in which titanium dioxide is sprayed on a glass substrate using spray pyrolysis (example 4) wherein the sample glass has dimensions of 10.16 cm x 10.16 cm, which would have an area of 0.01 m^2. Since the glass used in GREENBERG et al. can be at least 0.01 m^2 it would be obvious that the range would cover areas of 0.5 m^2 and above. It would have been obvious to use the same sized glass in the process of modified HISHINUMA et al. because they both produce a glass substrate with a titanium oxide film by the use of pyrolysis spray. Therefore, the claimed invention would have been obvious.

5. Claims 47 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over HISHINUMA et al (JP 2001-080939 A) in view of ALUMAXBATH (Tempered Glass) and LEWIS (glass) and CHAO (US 4,596,745) as applied to claims 42, 44, 48, 50, and 54-59 above, and further in view of DOUSHITA et al. (US 6,156,409).

HISHINUMA et al. as modified by Alumax Bath and LEWIS and CHAO discloses an apparatus for the production of a tempered glass sheet with photocatalytic titanium oxide film (JPO abstract). Modified HISHINUMA et al. fails to disclose the surfactant.

DOUSHITA et al. discloses a process for producing glass articles with a non-fogging film using metal oxides (abstract). DOUSHITA et al. discloses the use of a surfactant in the film (claim 1). It would be obvious to use a surfactant in the film of modified HISHINUMA et al. because the surfactant improves the anti-fogging property (col. 8, lines 4-6) and would cover stain constituents (col. 8, lines 16-18) which is a desirable trait in glass sheets. DOUSHITA et al. also discloses that the film has an arithmetic mean roughness of 1.5 to 80 nm (abstract), which would overlap with the range in instant claim 52. It is obvious that the film on the glass of modified HISHINUMA et al would have the same properties because they both teach a glass substrate with a titanium oxide film. Therefore, the claimed invention would have been obvious.

6. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over HISHINUMA et al (JP 2001-080939 A) in view of ALUMAXBATH (Tempered Glass) and LEWIS (glass) and CHAO (US 4,596,745) as applied to claims 42, 44, 48, 50, and 54-59 above, and further in view of NIWA et al. (US 6,408,743 B2).

HISHINUMA et al. as modified by Alumax Bath and LEWIS and CHAO discloses an apparatus for the production of a tempered glass sheet with photocatalytic titanium oxide film (DERWENT abstract). Modified HISHINUMA et al. discloses that if the thickness of the film exceeds 1.0 um, then the luster and haze may be become high and may not be suitable for practical use (trans. para. 21). Modified HISHINUMA et al. is silent as to what values are considered high. NIWA et al. discloses that a glass haze of 5% or less is considered to be desirable, which incorporates the range of instant claim

53. It is obvious that the glass of modified HISHINUMA et al. would preferably contain a haze of less than 5% because that is considered suitable for practical use. Therefore, the claimed invention would have been obvious.

Response to Arguments

7. Applicant's arguments filed January 15, 2009 have been fully considered but they are not persuasive. Applicant argues on page 8 that it would not have been obvious to apply a tempering treatment to the glass produced by HISHINUMA however, HISHINUMA discloses that the glass is intended for use as windows for buildings and automobiles (para. 0001) and Alumax Bath discloses guidelines for attaining glass sheets that follow the Federal Specification DD-G-1403B, which the glass sheets of HISHINUMA would be required to meet in order to be available for use in building applications. Applicant argues on page 9 that HISHINUMA fails to teach the use of anatase titanium oxide in the liquid film, however, since titanium oxide is a precursor to anatase titanic oxide and anatase titanic oxide is the desired end result, it would have been obvious to one of ordinary skill in the art that anatase titanic oxide could have been applied in the film liquid. The applicant argues on page 9 that HISHINUMA does not disclose praying the film on the glass at a temperature of less than 150°C, however, CHAO discloses that a glass may be preheated to a temperature of approximately 20 °C to 75 °C (col. 3, lines 51-55) before applying a titanium contained coating. It would have been obvious to one of ordinary skill in the art to use the temperatures of CHAO because CHAO provides optimal conditions for applying a titanium film on a glass sheet

before subsequent heating. Applicant argues on page 9 that LEWIS does not teach the superior properties associated with utilizing an alkali metal in the claimed range, however, the properties are irrelevant since LEWIS teaches that the sodium in soda lime glass would fall into the claimed range and soda lime glass is the conventional glass used in glass processes. Applicant argues on page 10 that HISHINUMA fails to teach heating the coated surface to the claimed temperature of 600°C to 700°C, however, Alumax Bath discloses that in a typical manufacturing process with tempering, glass is raised to a temperature of approximately 1200 °F (p. 1), or approximately 648 °C, which would fall into the range of instant claim 42. Applicant argues on page 10 that HISHINUMA fails to disclose holding the glass for a period of 20 to 500 seconds, however, Alumax discloses that the glass sheet is traveling through a tempering furnace at that temperature (p. 1), which indicates that the glass undergoes the temperature for an extended time. It would have been obvious that through optimization testing a person having skill in the art could have arrived at the heating time of instant claim 42. Applicant argues on page 12 that Alumax does not teach cooling the glass to 200°C, however, Alumax Bath discloses that a quenched condition becomes stable when the temperature is reduced to approximately 400 °F (p. 1), or approximately 204 °C, which would incorporate 200°C, since 200°C is approximately 204°C.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CYNTHIA SZEWCZYK whose telephone number is

(571)270-5130. The examiner can normally be reached on Monday through Thursday 7:30 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Carlos Lopez/
Primary Examiner, Art Unit 1791
CS